

Abstract

A low dark current CMOS image sensor pixel comprises a photodiode that is isolated from the field oxide by forming a relatively small photodiode within a relatively large active area such that the field oxide is substantially separated from the photodiode. The active area should be large enough such that the photodiode depletion region formed during operation of the photodiode does not touch the field oxide sidewall and corner. The isolation of the photodiode from the field oxide significantly reduces the number of dislocations near the field oxide that contribute to the dark current. Accordingly, the isolation of the photodiode from the field oxide dramatically reduces the dark current of the photodiode during operation. The present invention can be formed with a conventional CMOS process without adding any additional process steps.